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(54) Title: GREEN ETHYLENE WATER RECYCLE

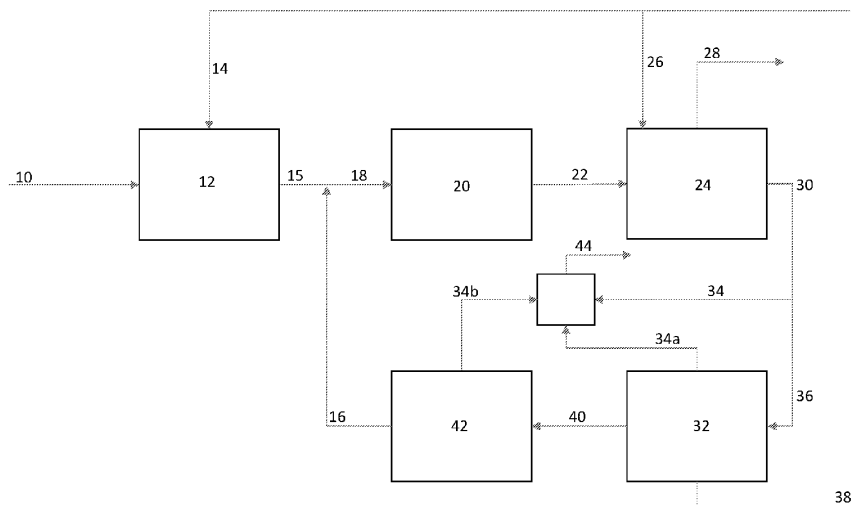


FIG. 1

(57) Abstract: Processes and systems for producing olefins, such as ethylene, includes feeding a steam-alcohol mixture to a dehydration reactor and dehydrating the alcohol to form a reaction effluent comprising an olefin and water. The process includes quenching and separating the reaction effluent to recover a quenched effluent and a gaseous hydrocarbon comprising the olefin. The quenched effluent is separated to form a volatile organic stream and an aqueous organic effluent. Solids, hydrocarbons, or both, may be removed from the quenched effluent, the aqueous organic effluent, or both. The process further includes one or both of: feeding a portion of the aqueous organic effluent as the quench medium, or, vaporizing a portion of the aqueous organic effluent, including water and hydrocarbonaceous compounds, to form a mixed dilution steam stream and a residue liquid, and diluting a vaporized oxygenated hydrocarbon feedstock with the mixed dilution steam stream to form the steam-oxygenated hydrocarbon mixture.

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